# AMENDMENT NO. 3 NOVEMBER 2020

# TO

# IS 14665 (PART 3/SEC 1) : 2000 ELECTRIC TRACTION LIFTS

## PART 3 SAFETY RULES

## Sec 1 Passenger and goods lifts

(*Page* 3, *clause* **9.1** *and* **9.1.1**) — Substitute the following for the existing clauses:

‘**9.1** A manually operated mains disconnecting switch, Iron clad or Miniature circuit breaker (MCB) in combination with Earth Leakage Circuit Breaker (ELCB)/Residual Current Circuit Breaker (RCCB) of suitable capacity, with a provision to have ‘Lockout’ facility wherein the main switch/s shall have capability of being locked in OFF position, and identification tag mentioning the information about the person/s who have done the lockout, shall be installed in the main circuit cable of electric lift machines or motor-generator sets. This switch shall be clearly marked/identified as to which lift it is controlling. Also, this switch shall be placed close to and visible from machine, controller, motor-generator set or any other equipment, it controls.’

(*Page* 3, *clause* **9.3**) — Substitute the following for the existing clause:

**‘9.3 Top of Lift Car Inspection Controls**

**9.3.1** ‘Top of lift car Inspection Control’ shall be provided on top of each lift car, easily accessible from landing, for use by persons working thereon (*see* Fig. 3). It shall, at minimum, have:

a) Emergency stop switch in accordance with **9.4.1**, **9.4.3** and **9.4.5**. When the switch is pushed- ‘STOP’ Position, it shall not be possible to move the lift car.

b) ‘INSPECTION’ switch shall be bi-stable type, preferably a rotary switch, with positions clearly marked/identified as ‘INSPECTION’ or ‘NORMAL’.

c) Single phase a.c. power with 3 pin socket, complying with relevant Indian Standard, with switch shall be provided for using power tools on top of lift car.

d) A lamp, sufficient enough to illuminate the top of lift car area, with control switch and guarding. Alternatively, a separate hand lamp with accessible control switch and guarding shall be provided at a convenient location on the top of lift car.

e) Three numbers spring loaded ‘PUSH’ type control buttons clearly identified as ‘UP’, ‘DOWN’ and ‘COMMON/RUN/START’ shall be provided. These buttons shall be operational only when the INSPECTION control switch is turned to ‘INSPECTION’ position. Also, they should require continuous pressure to be applied for their functioning.

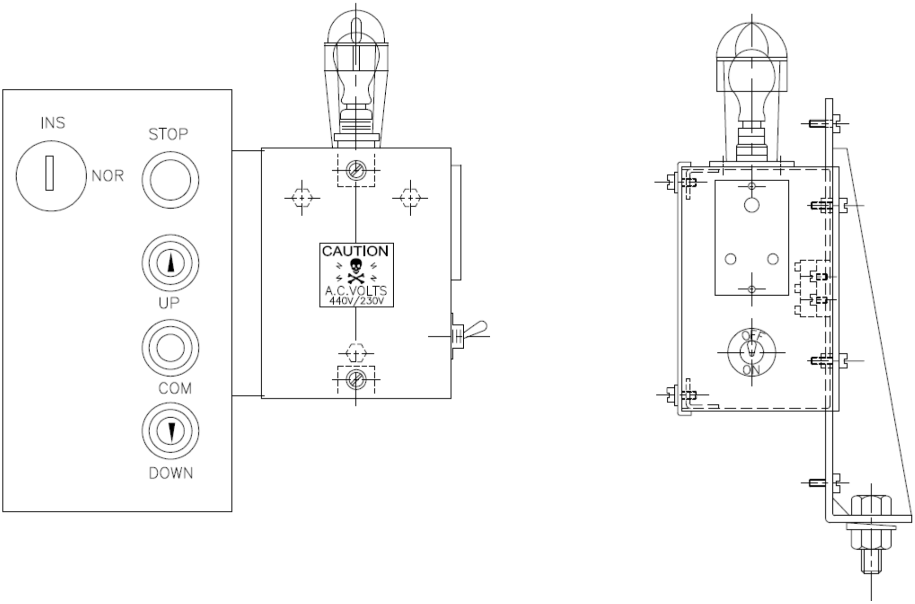


FIG. 3 SKETCH SHOWING TYPICAL TOP OF CAR INSPECTION CONTROL BOX

**9.3.2** For the inspection control installed on top of lift car, as mentioned in **9.3.1** (b), it shall be ensured that, when in use (rotary bi-stable switch in 'INSPECTION' position):

a) It shall not be possible to control the car from any other position. If similar control is provided in the elevator controller or machine room (emergency electrical operation), top of lift car control shall have priority over the similar control provided in controller or machine room.

b) The lift car can only be moved in desired direction by applying continuous pressure on corresponding direction button ('UP' or 'DOWN') and identified 'COMMON/RUN/START' button simultaneously. The lift shall stop immediately, if any of these buttons are released.

c) The car shall travel only at speed not exceeding 0.7 m/s.

d) The car shall not move until all safety devices are in circuit and remain in safe operating position.

e) It shall not be possible for the car to travel beyond the normal travel (beyond terminal landings).

f) It shall neutralise the normal operational controls, including operations of any power operated doors.'

(*Page* 3, *clause* **9.4) —** Substitute the following for the existing clause:

### '9.4 Emergency Stop Switches

Emergency stop switches shall also be provided in every pit, on top of every lift car and in machine room in case there is a level difference or split level, for use by persons working thereon, as per guidelines given below (also *see* Fig. 4)

**9.4.1** *Types of Emergency Stop Switch*

Emergency stop switches must be mushroom type single press stop and pull to run or single press stop and rotate to run position type switches. Piano type switches or toggle switches shall not be used for this application. The mushroom button must have a shroud guard around.

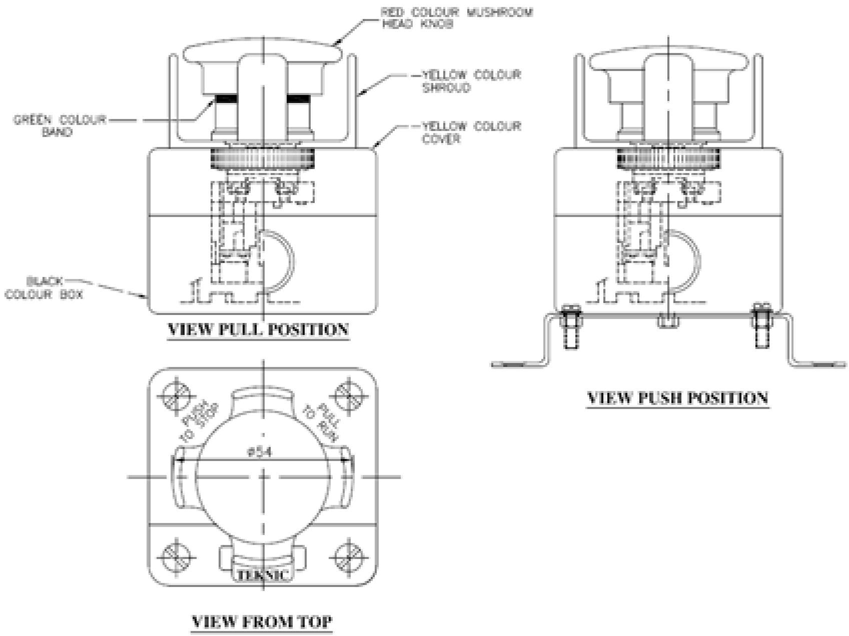


Fig. 4 Sketch Showing Typical Stop Switch

**9.4.2** *Emergency Stop Switches Requirement in Elevator Pit*

**9.4.2.1** Each elevator shall have two Emergency Stop Switches in every pit as shown in Fig. 5.

**9.4.2.2** The upper switch will be mounted 1.5 m above the floor level of the lowest landing. (A tolerance of +15 cm is allowed to accommodate site conditions. However, the upper switch shall not be lower than 1.5 m above the floor level of lowest landing). *See* Fig. 5.

**9.4.2.3** The stop switch should be mounted as close to the entrance as possible, so that it is easily accessible from outside. However, it shall not any way be more than 75 cm away from landing. *See* Fig. 5.

**9.4.2.4** The objective of **9.4.2.2** and **9.4.2.3** is that the mechanic who is required to actuate the switch shall be able to do so in a safe manner without requiring to lean too much inside the lift shaft or pit to actuate the switch.

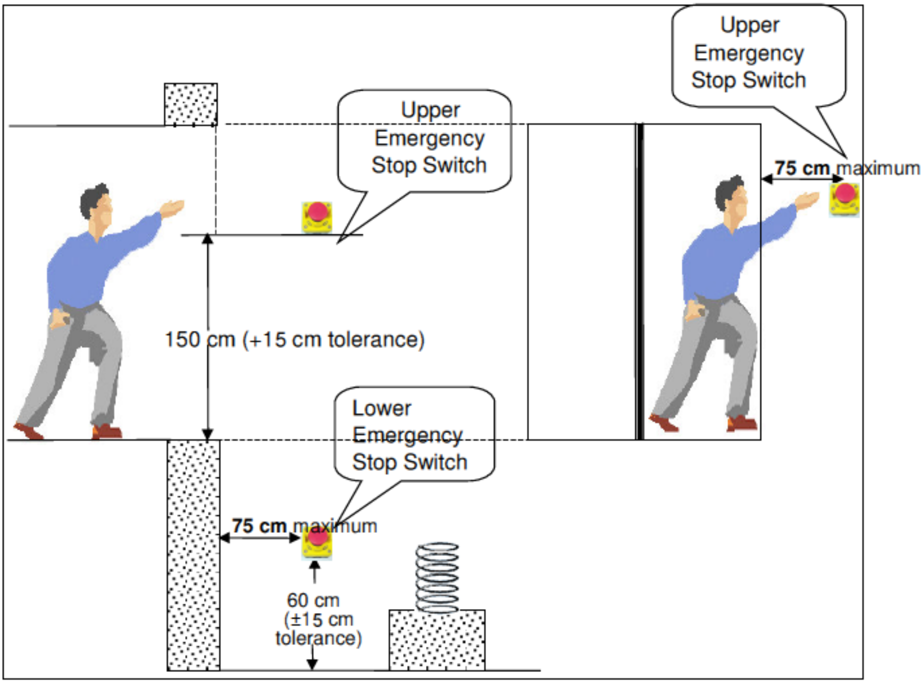


Fig. 5 Locations of Pit Emergency Stop Switches

**9.4.2.5** The lower Pit Emergency Stop switch should be 60 cm above the pit floor level (A variation of ±15 cm is allowed to accommodate site specific conditions). The objective of this requirement is that the mechanic should be able to actuate the switch while he is sitting on the pit floor. *See* Fig. 5.

**9.4.2.6** Both the switches must be adjacent to pit ladder but not behind the pit ladder. The position of the switches should be such that they are not touched inadvertently by the mechanic's shoes while he is climbing up/down the pit ladder.

**9.4.2.7** It is recommended that upper Pit Emergency Stop Switch and pit light switch are mounted close to each other. However, precautions as per **9.4.2.7** (a), (b) and (c) shall be taken.

a) The Pit Emergency Switch and pit light switch must be distinctly different in look as well as feel. Even when these are touched by hand in dark pits, it shall be possible to distinctly recognise the switches by touch.

b) The switches must be distinctly marked/identified.

c) The wiring of Pit Light Switch and Pit Emergency Stop Switch shall be isolated from each other.

**9.4.3** *Emergency Stop Switch on Car Top*

Every lift car shall have Emergency Stop Switch, as specified in **9.4.1**, located on top of car and shall be easily assessable from the landing and shall be placed within 75 cm of landing door edge. Normally a switch beyond 75 cm of distance from the inner hoistway edge of landing is considered unsafe and not easily accessible. This condition is typically seen in case of deep cars. In such cases, where such an Emergency Stop switch in 'INSPECTION' Control box as per **9.3.1**(a) cannot be located within 75 cm of landing door edge or if the lift car has multiple doors, additional emergency stop switch must be provided as per **9.4.5**.

**9.4.4** *Additional Emergency Stop Switches in the Elevator Pit*

Additional Emergency Stop Switches in the elevator pit, as per requirements in **9.4.2**, must be provided on each side of the entrance/s provided on the lowermost floor.

**9.4.5** *Additional Emergency Stop Switch on Car Top*

**9.4.5.1** Additional Emergency Stop Switch must be provided under the following conditions:

a) The Emergency Stop Switch of 'Top of Car Inspection Control' as per **9.3**, is located deep inside on the top of the lift and cannot be accessed from the landing without excessive leaning inside the hoistway on the car top.

b) The car has multiple doors and the car top is accessible from landing doors located at different sides of car.

**9.4.5.2** In the above situations, the additional Emergency Stop Switch must be provided and must be located within 75 cm from landing door edge and in such a way that it can be easily accessed. If the top of lift car can be accessed from different directions, because the landing doors are located differently at different floors, then additional car top emergency switches must be located such that they are within 75 cm from each such landing.

**9.4.6** *Additional Emergency Stop Switches in Machine Rooms*

**9.4.6.1** Additional Emergency Stop Switches for each lift in the lift machine rooms shall be provided in the following situations:

a) Split level machine rooms where the machine, controller and the main power switch are located on different levels and it is necessary to climb up/down to reach to main switch or controller from the machine.
b) When the elevator has secondary machine room.
c) Very large machine rooms, where the main power switch is located far away (5 m and above) from the machine.

**9.4.6.2** The additional Emergency Stop Switch must be located close to the machine (preferably closer to the main hoist rope sheave) and should be such that it can be easily accessed without any hindrance.'

(*Page* 3**,** *clause* **9.4**) — Insert the following new clause:

### '9.5 Requirement of Top of Lift Car Guardrail or Barricade

A toe board of 100 mm height shall be provided on all sides, except entrance side/s, on top of every lift car.

Guardrail or barricade shall be provided on top of each lift car when the perpendicular measured distance between edge of the car and the hoist-way wall (or hoist-way separation) is more than 300 mm on any side of the car.

As illustrated in Fig. 6, if any of these dimensions a1, a2 or a3 are more than 300 mm, car top guardrail or barricade and toe board with dimensions as specified in **9.5.2** shall be provided. Where the distance is less, provision of such guardrail/barricade is optional.

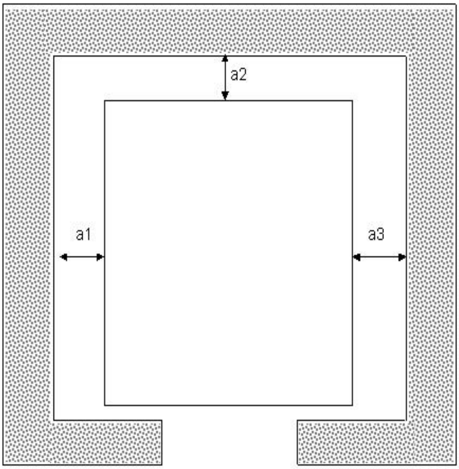


FIG. 6 TOP OF LIFT CAR DIMENSIONS

**9.5.1** *Car Top Guardrail Barricade Typical Arrangement*

CWT = Counterweight, JB = Junction Box, TOCI = Top of Lift Car Inspection Control and DO = Door Operator unit. *See* Fig. 7.

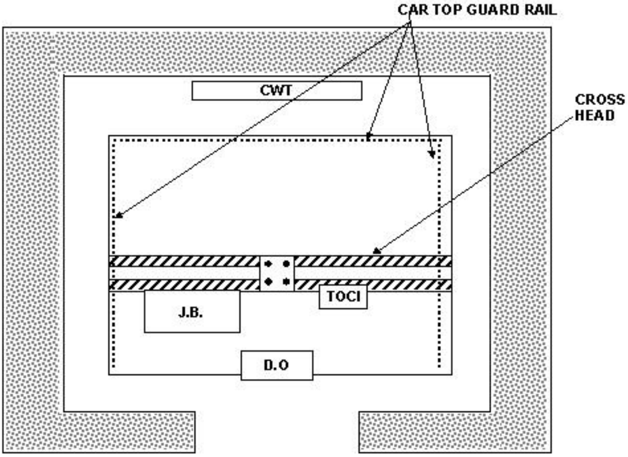


FIG. 7 TYPICAL ARRANGEMENT

**9.5.2** *Mechanical Specifications*

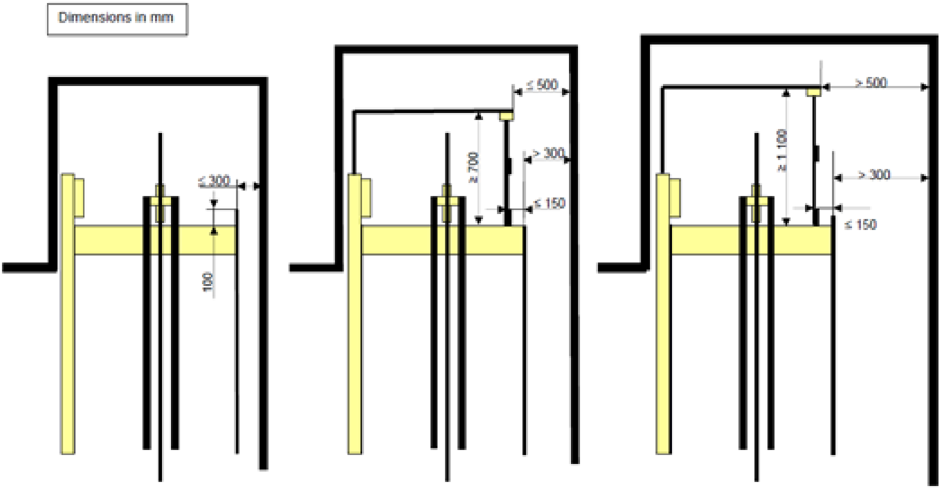
**9.5.2.1** It shall consist of guardrails, a toe board of 100 mm height and mid-rails as specified in **9.5.2.4**.

**9.5.2.2** The guardrail or the barricade shall be located within 150 mm maximum of the edges of the car roof.

**9.5.2.3** Considering the free distance in horizontal plane beyond the outer edge of the guardrail of the barricade (*see* Fig. 8), its height shall be at least:

**9.5.2.3.1** 700 mm where the free distance is up to 500 mm.

**9.5.2.3.2** 1 100 mm where the free distance exceeds 500 mm.



All dimensions in mm

FIG. 8 TOP OF CAR GUARD RAIL OF BARRICADE-HEIGHT

**9.5.2.4** There shall be a mid-rail installed so as to ensure that when a person is working on car top in sitting or squatting position, he will not fall into the hoistway, in case he loses his balance.

**9.5.2.5** The car top guardrail/barricade shall be installed on three sides of the car and need not be on the landing gate side. If the car has landing gates on two sides then car top guardrail shall be installed only on two sides.

**9.5.2.6** While installing car top guardrail it should be ensured that each member of the guardrail is at least 100 mm away from any stationary item or projection in the hoist-way. This will ensure that while moving the car up and down, the employee on the car top is less likely to be hit by any hoist-way projection.

**9.5.2.7** If the gap between the front edge of car top and the hoistway wall on the landing gate side is more than 300 mm (Refer to Fig. 9), then the guard rail should be shaped such a way that it guards this gap but keeps landing gate access open.

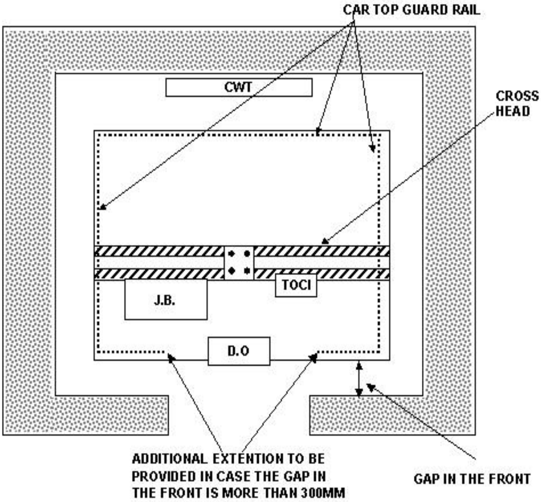

CAR TOP GUARD RAIL
CWT
CROSS HEAD
TOCI
J.B.
D.O
ADDITIONAL EXTENTION TO BE PROVIDED IN CASE THE GAP IN THE FRONT IS MORE THAN 300MM
GAP IN THE FRONT

FIG. 9 GAP IN FRONT SIDE

**9.5.3** *Recommended Details*

a) The members of car top guardrail/barricade are fastened using suitable arrangement such as nut-bolts, rivets etc. or may be welded. Fastening shall be firm and shall not move more than 10 mm if shaken by hand.

b) The mechanical strength of the car top guardrail should be such that it can take a load of 75 kg vertically and horizontally independently and does not leave any permanent deformation of guardrail members. Normally on job sites it is difficult to arrange a load of 75 kg and also measure the deformation, etc. Following guidelines may be used while designing the steel members used to make the guardrail.

   1) MS Angle 35 mm × 35 mm × 3 mm (Minimum).
   2) MS Slotted Angle 45 mm × 45 mm × 3 mm (Minimum).
   3) If the horizontal length of the guardrail member is more than 1 200 mm then a vertical supporting members to be provided at the mid-point of the horizontal member. If the length is too large (in case of freight elevator or hospital elevator) a vertical support to be provided at suitable locations so that the distance between any two vertical members is not more than 1 200 mm.

If (1), (2) and (3) are ensured the load bearing capacity of the guard rail members can be reasonably assured. Any other design meeting requirements above can be used.'

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